REMARKS

Claims

Claims 1-3, 6-11, 13-30, 33-34, 39-42 and 44-49 are now pending.

Claim 1 has been amended to include the subject matter of claims 4 and 5 and have been further amended to define a sequence which is 80% identical to SEQ ID NO: 2 and a fragment which is at least 200 amino acids long. Further support for these amendments are found on page 11, lines 6-10 and page 12, lines 9-12 of the present application.

Claim 2 has been amended and claim 47 has been added to define a polypeptide which is capable of cleaving xylogalacturonan between adjacent galacturonan non-terminal units, support for which is found on page 3, lines 13-15.

Claim 8 has been amended to define that the polynucleotide encodes are is a complement to a polynucleotide that encodes the polypeptide of claim 1.

The remainder of the claim amendments are directed to minor technical changes which do no effect the scope of the claims.

Support for new claims 45-46 and 48 is found in original claims 1-3

Support for new claim 49 is found in the present application on page 11, line 9, for example.

Unity

With respect to the lack of unity objection, applicants respectfully submit that the polynucleotide claims and those claims dependent thereof now depend from claim 1, which is respectfully submitted to be novel over the cited art. Thus, applicants respectfully request rejoinder of these claims as well as the method claims which depend from claim 1.

Specification

The Office objected to the specification for a lack of an abstract although such an abstract is found on the title page of the PCT application. Nonetheless, the applicants have submitted a new abstract to replace the abstract present on the title page.

35 U.S.C. §101

Applicants traverse the rejection of claim 1-6 under 35 U.S.C. § 101 as being directed to non-statutory subject matter. Applicants have defined the polynucleotide of claim 1 as "isolated" thus obviating this rejection. Thus, applicants request withdrawal of this rejection. With regard to the claim objections, claims 3-6 and 21, and well as the withdrawn claims have been amended to appropriately recite "the" instead of "a" where needed. Claim 4 is deleted, thus obviating the objection as to this claim.

Indefiniteness

Applicants traverse the rejection of claims 4 and 34 under 35 U.S.C. § 112, second paragraph as indefinite. Claim 4 has been deleted thus obviating the rejection as to this claim. Amended claim 1 refers a homologous sequence as at least 80% identical to SEQ ID NO: 2, and as such, this rejection does not apply to claim 1. Claim 34 has been amended to delete the parentheses enclosing "animal". Thus the indefiniteness rejection with respect to claims 4 and 34 may be properly withdrawn.

Written Description

Applicants traverse the rejection of claims 1-5, 20-21, and 34 under 35 U.S.C. § 112, first paragraph (written description). Applicants have amended claim 1 to include the structural features of a substantial portion of the genus of endo-xylogalacturonase, and thus applicants respectfully submit that the present claims have appropriate written description.

Moreover, Example 4.1 describes fully conserved regions of XghA which are thought to be involved in the hydrolysis reaction and refers to amino acids involved in substrate binding, which are present in the fourth domain. Page 12 of the present application also suggests conserved substitutions which may be made. In addition, the specification also suggests that the end-terminal signal peptide is not critical to the endo-xylogalacturonase activity. Thus, applicants respectfully submit that a skilled artisan would understand that the applicants had possession of the genus of polypeptides defined in claim 1. Thus, applicants respectfully request withdrawal of the written description rejection.

New claim 48 defines the polypeptide more narrowly than claim 1. New claim 49 is directed to a polypeptide which is SEQ ID NO: 2 or a sequence which is 95% identical thereto and likewise contains appropriate written description.

Enablement

Applicants traverse the rejection of claim 1-5, 20-21 and 34 under 35 U.S.C. § 112, first paragraph (enablement). Applicants respectfully submit, as described in the "written description" section above, that the present application describes which changes can be tolerated in a protein amino acid sequence to obtain the desired activity. Further, applicants respectfully submit that the present application describes on page 22-23 assays for identifying and confirming endo-xylogalacturonase activity. Example 3.3 further shows how a skilled artisan can determine whether a polypeptide has endo-xylogalacturonase. As polypeptides of claim 1 are defined as either SEQ ID NO: 2, sequences highly homologous thereto or large fragments thereof, a skilled artisan would understand how to make such sequence and test them for endo-xylogalacturonase activity without undue burden. Thus, applicants respectfully submit that the enablement rejection be withdrawn.

Anticipation

Applicants traverse the rejection of claims 1-3 and 20 under 35 U.S.C. § 102(b) as being anticipated by Renard and Schols. Applicants respectfully submit that claims 4-5 were not included in this art rejection and the subject matter thereof has been included in claim 1. Furthermore,

applicants respectfully submit that these references do not disclose an endo-xylogalacturonase. In the background of the invention section of the present application, pectin is described which contains a "smooth" homogalacturonan region and ramified "hairy" regions. The "smooth" regions consist of linear homogalacturonan which may be degraded by known pectinases. The "hairy" regions consist of three subunits. Subunit 1, which is xylogalacturonan, subunit 2 which is rhamnogalacturonan, and subunit 3 which is a rhamnogalacturonan oligomer. The present invention is directed to endo-xylogalacturonase which degrade xylogalacturonan of subunit 1 of the "hairy" region of the pectin.

In contrast, Renard describes fractions hydrolyzed by endo-polygalacturonase which were not hydrolyzed by xylanase. Both these enzymes differ from the endo-xylogalacturonase as claimed. Endo-xylanase is an enzyme able to hydrolyze xylan polymer in an endo fashion, and endo-polygalacturonase is an enzyme which degrades a smooth, homogalacturonan regions. This document does not teach or suggest enzymes with polygalacturonase activity. Indeed, on page 62, discussion, Renard appears to suggest that the hydrolysis of pectin by polygalacturonase produces intact xylogalacturonan.

Further, Schols merely teaches isolation of xylogalacturonan subunits present in the "hairy" regions of pectin but it does not teach the hydrolysis thereof. Polygalacturonase and rhamnogalacturonase enzymes are mentioned but differ from the endo-xylogalacturonase as claimed. Thus, applicants respectfully submit that the present claims distinguish over the cited art.

Thus, applicants respectfully submit that the anticipation rejection may be properly withdrawn.

CONCLUSION

Applicants respectfully submit that the claims as amended contain appropriate written description, and are properly enabled and distinguished over the art. In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to withdraw the outstanding rejection of the claims and to pass this application to issue. If it is determined that a telephone conference would expedite the prosecution of this application, the Examiner is invited to telephone the undersigned at the number given below.

In the event the U.S. Patent and Trademark office determines that an extension and/or other relief is required, applicant petitions for any required relief including extensions of time and authorizes the Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to Deposit Account No. 03-1952 referencing docket no. 251502008400. However, the Commissioner is not authorized to charge the cost of the issue fee to the Deposit Account.

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Respectfully submitted,

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